ENDAT-GX201

User's Manual

Rev. 1A

For GX201 PCB ver. 1C or later

03/02/2007

ENDAT-GX201 USER'S MANUAL
UNICORN COMPUTER CORP.

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Installation Notice

The manufacturer recommends using a grounded plug to ensure proper motherboard operation. Care should be used in proper conjunction with a grounded power receptacle to avoid possible electrical shock. All integrated circuits on this motherboard are sensitive to static electricity. To avoid damaging components from electrostatic discharge, please do not remove the board from the anti-static packing before discharging any static electricity to your body, by wearing a wrist-grounding strap. The manufacturer is not responsible for any damage to the motherboard due to improper operation.

Specification:

Model	ENDAT-GX201
Form Factor	Mini-ITX 170 mm x 170 mm (6.69"x6.69")
CPU	AMD GEODE GX 500 processor @ 1.1W power consumption
System Chipset	AMD GEODE GX + CS5536
DIMM Socket	One DDR DIMM socket supports 200MHz up to 512MB DDR
VGA Adapter	Integrated 2D graphics engine by AMD GEODE GX CPU
LCD Supporting	9, 12, 18, 24bit TFT LCD Panel with TTL interface 18, 24bit LVDS interface (Optional)
LAN Adapter	2 x Realtek 8139D 10/100 Ethernet adapter
IDE Connector	One IDE channel support up to 2 EIDE devices (1 x 40-pin + 1 x 44-pin shared), UDMA 33/66/100 mode and BIOS auto-detect
FDD Connector	1 x FDD connector
AC97' Audio	Phone Jack + Pin Header
USB Port	4 x USB2.0 onboard
I/O Port	4 x COMs w/+5V, +12V selector /1 x Parallel port
RS-422/485	Optional via COM2
Digital IO	8 bit bi-directional I/O ports (standard on-board support) + 8 bit input and 8 bit output while the IT8888 present (optional)
WDT	programmable 1~255 seconds / minutes
Expansion Slot	1 x 120Pin PCI connector 1 x PC104 (Optional) 1 x One mini-PCI socket onboard (Optional)
Power Supply	ATX power support

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Chapter 1. Introduction

To rise to the challenges of the system heating issues and more and more demands of diminutive embedded system in diverse applications, we designed and made ENDAT-GX201 system board as an ultimate solution integrated with AMD GEODE GX technology CPU. ENDAT-GX201 is not only the ideal solution for Hi-End POS systems, but also could be well adapted to various applications such as kiosks, networking systems, controlling terminals and other embedded systems with FANLESS environment.

ENDAT-GX201 is designed with AMD GEODE GX 500 and the CS5536. One DDR DIMM socket supports 200MHz up to 512MB DDR. The DRAM controller supports standard DDR200 Synchronous DRAM (DDR SDRAM).

ENDAT-GX201 integrates 2D graphics controller which enables ENDAT-GX201 to support TFT LCD panel or CRT/LCD monitor (not support LCD + CRT operate mode).

ENDAT-GX201 supports TFT LCD panels through the TTL or LVDS interface, which includes 9-bit, 12-bit, 18-bit, and 24-bit of TTL or LVDS interfaces.
Resolutions up to 1280 x 1024 for TFT LCD or 1600 x 1200 for CRT/LCD monitor.

ENDAT-GX201 has one standard PCI slot as well as a miniPCI socket support standard PCI adapter with PCI 2.2 compliant; moreover, it has PC104 module connector reserved as optional feature.

The ideal solution of ENDAT-GX201

- POS system
- KIOSK
- Interactive system
- Airport Terminal Controller
- Industrial controller
- Digital entertainment
- Embedded system equipment

1-1. Features

Basic Feature:

- A cost effective platform with x86 architecture.
- Embedded AMD GEODE GX 500 processor @ 1.1W power consumption to offer a totally FANLESS solution.
- One DDR DIMM socket supports 200MHz up to 512MB DDR.
- An internal 2D graphics controller with 4/6/8/12/16 MB frame buffer share with system memory
- Integrated 2D graphics controller resolutions up to 1600 x 1200 for CRT/LCD monitor.
- Direct Flat panel interface supports 24-bit TFT/LVDS LCD panel, the resolution up to 1280 x 1024 x 24.
- 1-channel LVDS interface on-board by optional feature.
- 8 bit bi-directional I/O ports (8 bit input and 8 bit output) if IT8888 (PC104 feature) presents.
- Standard PCI slot supports standard PCI adapter with PCI 2.2 compliant. A miniPCI socket and PC104 module connector by optional features.
- AC97' Audio with 1.2W amplifier built-in.

Software Support

- Drivers for major embedded operating systems: Windows XP, Windows XP embedded and Windows CE 5.0.

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Ordering information:

1. ENDAT-GX201: Standard version.
2. ENDAT-GX201-P: Support 1 PC104 module connector.
3. ENDAT-GX201-M: Support 1 miniPCI socket.
4. ENDAT-GX201-L: Support 1 channel LVDS with 18, or 24-bit data formats.

Note:

1. *The standard version of ENDAT-GX201 will not equip any optional feature listed above.*
2. *Both PC104 (ENDAT-GX201-P) and miniPCI (ENDAT-GX201-M) features require a MOQ amount for production in UNICORN. Please contact the sales department for more detail.*

1-2. Unpacking

The motherboard comes securely packaged in a sturdy cardboard shipping carton. In addition to the User's Manual, the motherboard package includes the following items:

- ENDAT-GX201 System Board
- HDD/FDD/Serial port Cables
- LCD cable **(Optional)**
- IDE Driver includes: Drivers for Windows NT 3.x/4.x, Windows 95, 98, ME, 2000, XP, Novell Netware and AMI / AWARD FLASH ROM utilities.
- Driver utilities for on-board VGA drivers, LAN adapter

If any of these items are missing or damage, please contact the dealer from whom you purchase the motherboard. Save the shipping material and carton in the event that you want to ship or store the board in the future.

Note: Leave the motherboard in its original package until you are ready to install it!

1-3. Electrostatic Discharge Precautions

Make sure you properly ground yourself before handling the motherboard, or other system components. Electrostatic discharge can easily damage the components. Note: You must take special precaution when handling the motherboard in dry or air-conditioned environments.

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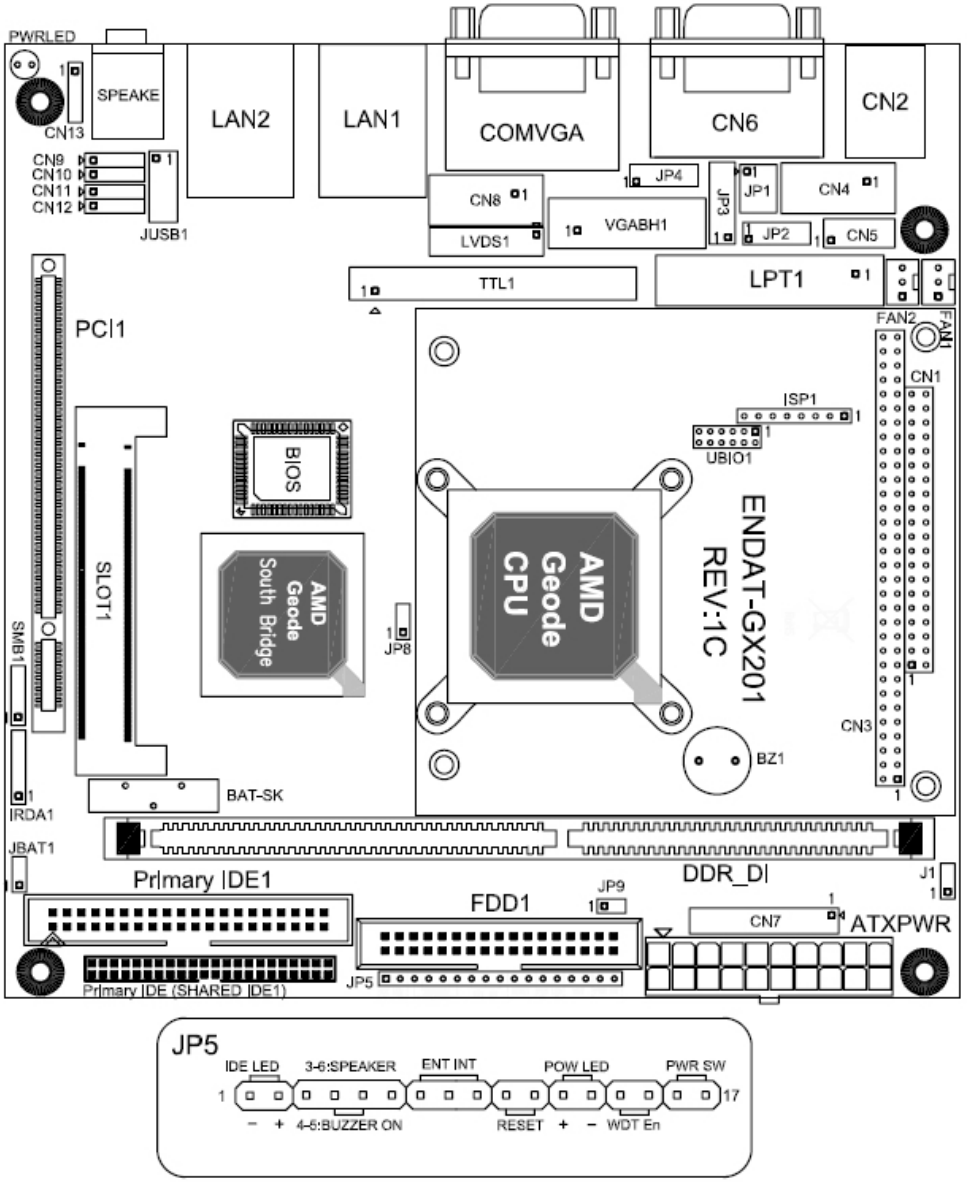
1-4. MOTHERBOARD LAYOUT



Chapter 2. Setting up the Motherboard

2-1. Jumpers and Connectors

Connectors Overview:

Function	Jumpers/Connectors
ATX Power Connector	ATX1
DDR SDRAM Socket	DIMM1
LAN/USB Connector	LAN1, LAN2
CRT Output Connector	COMVGA (lower side)
CRT Box Header	VGABH1
COM1 Connector	CN6 (upper side)
COM2 Connector	CN6 (lower side)
COM3 Connector	COMVGA (upper side)
COM3 Box Header	CN8 (shared)
COM4 Box Header	CN4
LINE IN/SPEAKER OUT connector	LIN-SPK1
LPT1 Box Header	LPT1
FDD Connector	FDD1
IDE Connector	IDE1, IDE1B (shared IDE1)
PC104 Connector	CN1 + CN3
MINI-PCI Socket	SLOT1
PCI Slot	PCI1
LCD Panel Connector	TTL1
LVDS Panel Connector	LVDS1
USB Port Header	JUSB1
Cooling Fan Connector	FAN1, FAN2
PS/2 MS/KB Pin Header	CN5
IR Pin Header	IRDA1
SM Bus Header	SMB1
DIGITAL I/O Pin Header (w/ buffer)	JP7
DIGITAL I/O Pin Header (w/o buffer)	UBIO1
MIC IN Header	CN10
LINE IN Header	CN9
LINE OUT Header	CN11
CD In Header	CN12
SPEAKER OUT Header	CN13
Reserved for factory	ISP1

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Jumpers Overview:

Function	Jumpers/Connectors
Clear CMOS	JBAT1
LCD Voltage Selector	JP6
LVDS Trigger Edge Selector	JP7
Header for Case Panel	JP5
HDD active LED	JP5: Pin 1(-), Pin 2(+)
External Speaker	JP5: Pin 3, Pin 6
Buzzer On/Off	JP5: Pin 4, Pin 5
External/Internal power good	JP5: Pin 7, Pin 8 (external) JP5: Pin 8, Pin 9 (internal)
Hardware Reset Switch	JP5: Pin 10, Pin 11
Power LED	JP5: Pin 12(+), Pin 13(-)
WDT Function Enable/Disable	JP5: Pin 14, Pin 15
ATX Power Supply On/Off Switch	JP5: Pin 16, Pin 17
COM Port Voltage Selector	JP2 (COM3/4), JP4 (COM1/2)
RS232 / 422/ 485 Selector for COM2	JP1 & JP3
DIGITAL I/O Voltage Selector (JP7 only)	J1
LCD / CRT selector	JP8
Restore on AC power loss	JP9

Please double-check the insertion and orientation of the LCD cable before applying power. Improper installation will result in permanent damage LCD panel.

Part 1: Onboard Jumpers

JBAT1: CMOS Data Clear (1x3 with 2.0mm)

Pin 1-2 *	Normal
Pin 2-3	Close for clear CMOS

JP8: LCD / CRT selector (1x3 with 2.0mm)

Pin 1-2	LCD
Pin 2-3*	CRT

JP6: LCD Voltage Selector (2x3 with 2.0mm)

Pin 1-2 *	+3.3V
Pin 3-4	+5V
Pin 5-6	+12V

Caution: Improper setting will damage LCD panel.

JP7: LVDS Trigger Edge Selector (1x3 with 2.0mm)

Pin 1-2 *	Rising edge
Pin 2-3	Falling edge

JP5: Pin Header for Case Panel (1x17 with 2.54mm)

Pin No.	Function
1(-), 2(+)	HDD active LED
3,6	External Speaker
4,5 *	Buzzer On/Off
7,8	External power good
8,9 *	Internal power good
10,11	Hardware Reset Switch
12(+), 13(-)	Power LED
14,15	Close: Enable WDT function
16,17	ATX Power On/Off

JP1, JP3: RS232 / 422 / 485 Selectors for COM2 (2.0mm)

TYPE	JP1 (3x4 with 2mm)	JP3 (2x7 with 2mm)
RS-232 *	1-2, 4-5, 7-8, 10-11	1-2
RS-422/485	2-3, 5-6, 8-9, 11-12	3-4, 5-6

JP2, JP4: COM Port Voltage Selector (2x6 with 2.0mm)

Voltage	+12V(DC)	R.I. *	+5V(DC)
COM1 (JP4)	1-2	3-4	5-6
COM2 (JP4)	7-8	9-10	11-12
COM3 (JP2)	1-2	3-4	5-6
COM4 (JP2)	7-8	9-10	11-12

J1: DIGITAL Output Voltage Selector (CN7 only, 1x3 with 2.0mm)

Pin 1-2 *	+3.3V
Pin 2-3	+5V

JP9: Restore on AC power loss (1x2 with 2.54mm)

Close	Enable
Open*	Disable

When JP9 was been closed, the system power will turn on automatically when AC power apply.

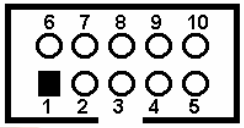
Part 2: Onboard connectors

VGABH1: CRT Box Header Connector (2x8 with 2.54mm)

Pin No.	Description	Pin No.	Description
1	RED	**9**	N.C / +5V
2	GREEN	**10**	GND
3	BLUE	**11**	N.C.
4	N.C.	**12**	DDC DAT
5	GND	**13**	H-Sync
6	GND	**14**	V-Sync
7	GND	**15**	DDC CLK
8	GND		

CN8/4: Box Header Type Connector for COM3/4 port (2x5 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	DCD	**6**	DSR
2	RXD	**7**	RTS
3	TXD	**8**	CTS
4	DTR	**9**	RI
5	GND	**10**	N.C.



LPT1: Printer Port Box Header (2x13 with 2.54mm)

Pin No.	Description	Pin No.	Description
1	STB#	**10**	ACK#
2	PD0	**11**	BUSY
3	PD1	**12**	PE
4	PD2	**13**	SLCT
5	PD3	**14**	AFD#
6	PD4	**15**	ERR#
7	PD5	**16**	INIT#
8	PD6	**17**	SLIN#
9	PD7	**18-25**	GND

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FDD1: FDD Box Header (2x17 with 2.54mm)

Pin No.	Description	Pin No.	Description
1,3,5,7	GND	**14**	DSA#
9,11,13	GND	**16**	MOB#
15,17,19	GND	**18**	DIR
21,23,25	GND	**20**	STEP#
27,29,31	GND	**22**	WD#
33	GND	**24**	WE#
2	RWC#	**26**	TRAK0
4,6	N.C	**28**	WP#
8	INDEX#	**30**	RDATA#
10	MOA#	**32**	HEAD#
12	DSB#	**34**	DSKCHG#

IDE1 Box Header (2x20 with 2.54mm)

Pin No.	Description	Pin No.	Description
1	IDE Reset#	**2**	GND
3	IDE data7	**4**	IDE data8
5	IDE data6	**6**	IDE data9
7	IDE data5	**8**	IDE data10
9	IDE data4	**10**	IDE data11
11	IDE data3	**12**	IDE data12
13	IDE data2	**14**	IDE data13
15	IDE data1	**16**	IDE data14
17	IDE data0	**18**	IDE data15
19	GND	**20**	N.C.
21	IDE REQ	**22**	GND
23	IDE IOW#	**24**	GND
25	IDE IOR#	**26**	GND
27	IDE Ready	**28**	GND
29	IDE ACK#	**30**	GND
31	IDE IRQ	**32**	N.C.
33	IDE A1	**34**	P66DET
35	IDE A0	**36**	IDE A2
37	IDECS1#	**38**	IDESC3#
39	HDLED#	**40**	GND

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IDE1B: Slim IDE1 Connector (2x22 with 2.0mm)

Pin No.	Description	Pin No.	Description
1	IDE Reset#	**2**	GND
3	IDE data7	**4**	IDE data8
5	IDE data6	**6**	IDE data9
7	IDE data5	**8**	IDE data10
9	IDE data4	**10**	IDE data11
11	IDE data3	**12**	IDE data12
13	IDE data2	**14**	IDE data13
15	IDE data1	**16**	IDE data14
17	IDE data0	**18**	IDE data15
19	GND	**20**	N.C.
21	IDE REQ	**22**	GND
23	IDE IOW#	**24**	GND
25	IDE IOR#	**26**	GND
27	IDE Ready	**28**	GND
29	IDE ACK#	**30**	GND
31	IDE IRQ	**32**	N.C.
33	IDE A1	**34**	P66DET
35	IDE A0	**36**	IDE A2
37	IDECS1#	**38**	IDESC3#
39	HDLED#	**40**	GND
41	VCC (+5V)	**42**	VCC (+5V)
43	GND	**44**	N.C.

TTL1: TTL LCD Panel Box Header (2x22 with 2.0mm)

Pin No.	Signal	Pin No.	Signal
1	VBL (+12V)	**2**	VBL (+12V)
3	GND	**4**	GND
5	LCD-PWR	**6**	LCD-PWR
7	ENBKLT	**8**	GND
9	B0	**10**	B1
11	B2	**12**	B3
13	B4	**14**	B5
15	B6	**16**	B7
17	G0	**18**	G1
19	G2	**20**	G3
21	G4	**22**	G5
23	G6	**24**	G7
25	R0	**26**	R1
27	R2	**28**	R3
29	R4	**30**	R5
31	R6	**32**	R7
33	GND	**34**	GND
35	CLK	**36**	V-SYNC
37	DE	**38**	H-SYNC
39	GND	**40**	LCD-PWR
41	LCD-PWR	**42**	**KEY**
43	LCD-PWR	**44**	LCD-PWR

LVDS1: LVDS LCD Pin Header (2x8 with 2.54mm)

Pin No.	Description	Pin No.	Description
1	Y0-	**2**	Y2-
3	Y0+	**4**	Y2+
5	Y1-	**6**	LCD-PWR
7	GND	**8**	Y3-
9	Y1+	**10**	Y3
11	CK-	**12**	LCD-PWR
13	CK+	**14**	ENBKLT
15	VBL (+12V)	**16**	GND

Please make sure the Pin 1 location before inserting the LCD connector.

JUSB1: Pin Header for USB port (2x5 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	USB_VCC	**2**	USB_VCC
3	USBD2-	**4**	USBD3-
5	USBD2+	**6**	USBD3+
7	USB_GND	**8**	USB_GND
9	USB_GND	**10**	USB_GND

FAN1, FAN2: Cooling Fan Connector

Pin No.	Function
1	GND
2	+12V
3	Sensor Pin

CN5: PS/2 Keyboard / Mouse Pin Header (2x5 with 2.0mm)

Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	KB Data	**2**	MS Data
3	KEY	**4**	KEY
5	GND	**6**	GND
7	+5V(DC)	**8**	+5V(DC)
9	KB_CLK	**10**	MS_CLK

IRDA1: IR Pin Header (1x5 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	+5V	**4**	GND
2	N.C	**5**	IRTX
3	IRRX		

SMB1: SM Bus Pin Header (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	SMBCK	**3**	+3.3V
2	SMBDT	**4**	GND

CN7: DIGITAL I/O Pin Header (2x13 with 2.0mm)

Pin No.	Function	Pin No.	Function
1	DIO-O0	2	DIO-O4
3	DIO-O1	4	DIO-O5
5	DIO-O2	6	DIO-O6
7	DIO-O3	8	DIO-O7
9	GND	10	+5V
11	+12V	12	+3.3V
13	GND	14	KEY
15	+3.3V	16	+12V
17	+5V	18	GND
19	DIO-I0	20	DIO-I4
21	DIO-I1	22	DIO-I5
23	DIO-I2	24	DIO-I6
25	DIO-I3	26	DIO-I7

Note: Only available when PC104 function present

UBIO1: DIGITAL I/O (w/o buffer) Pin Header (2x6 with 2.0mm)

Pin No.	Function	Pin No.	Function
1	+3.3V	2	GND
3	GPIO0	4	GPIO4
5	GPIO1	6	GPIO5
7	GPIO2	8	GPIO6
9	GPIO3	10	GPIO7
11	GND	12	+3.3V

CN10: MIC IN (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	MIC POWER	2	GND
3	GND	4	MIC IN

CN9: LINE IN (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	LINE IN-L	2	GND
3	GND	4	LINE IN-R

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CN11: LINE OUT (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	LINE OUT-R	2	GND
3	GND	4	LINE OUT-L

CN12: CD IN Pin Header (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	CD IN-R	2	GND
3	GND	4	CD IN-L

CN13: SPEAKER OUT (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	SPEAKER OUT-R	2	GND
3	GND	4	SPEAKER OUT-L

D-SUB Type Connector for COM2 port (RS-232)

Pin No.	Description	Pin No.	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

D-SUB Type Connector for COM2 port (RS-422→ 4 Wire)

Pin No.	Function	Pin No.	Function
1	–TXD	**6**	NA
2	+RXD	**7**	NA
3	+TXD	**8**	NA
4	NA	**9**	–RXD
5	NA		

D-SUB Type Connector for COM2 port (RS-485→ 2 Wire)

Pin No.	Function	Pin No.	Function
1	Data –	**6**	NA
2	NA	**7**	NA
3	Data +	**8**	NA
4	NA	**9**	NA
5	NA		

ATXPWR: ATX Power connector

ATX

3.3V	**11**	**1**	3.3V
–12V	**12**	**2**	3.3V
GND	**13**	**3**	GND
PS ON	**14**	**4**	+5V
GND	**15**	**5**	GND
GND	**16**	**6**	+5V
GND	**17**	**7**	GND
–5V	**18**	**8**	POWER OK
+5V	**19**	**9**	5V SB
+5V	**20**	**10**	+12V

2-2. Installing Memory

The ENDAT-GX201 CPU board offers one 184pin DDR DIMM socket supporting up to 512MB of memory. The DDR memory can be DDR200, DDR266, DDR333 or DDR400.

2-3. Shared VGA Memory

The ENDAT-GX201 is using built-in graphic controller with Unified Memory Architecture (UMA) - **up to 16MB** of system memory. The amount of video memory on motherboard determines the number of colors and the video graphic resolution.

2-4. IRQs Mapping

The IRQ number is automatically assigned to PCI expansion cards after those used by onboard device. To install a PCI riser card, you need to set the correct "ADSEL" and "INT" (interrupt) assignment.

IRQ	Status	Assignment
0	Occupied	Timer
1	Occupied	Keyboard
2	Occupied	Second 8259
3	Occupied	COM2/COM4 shared
4	Occupied	COM1/COM3 shared
5	Occupied	LPT1
6	Occupied	Floppy Disk
7	**Free**	**Any**
8	Occupied	RTC
9	**Shareable**	**ACPI controller**
10	**Free**	**Any**
11	**Free**	**Any**
12	**Free**	**When PS/2 mouse absent**
13	Occupied	Coprocessor
14	**Free**	**When IDE device absent**
15	Occupied	Reserved

2-5. Watch Dog Timer

- **H/W jumper:**

JP5: Pin 14, Pin 15, WDT Function Enable (close) Disable (open).

- **S/W Port Address**: Base address (0x800).

Offset: 0x47 (GPIO register)

Bit	Function	00	01	10	11
1..0	Reserved				
3..2	Function selector	Reserved			WDT
7..4	Reserved				

Offset: 0x65 (Time unit register)

Bit.	Function	0	1
6..0	Reserved		
7	Minute/Second	Minute	Second

Offset: 0x66 (Time out value register)

Bit.	0x00~0xff
7..0	1~255 minutes/seconds (0x00 is disable WDT)

Offset: 0x67 (Configuration register)

Bit	Function	0	1
0	Reserved		
1	Keyboard enable	WDT ignore KB interrupt	WDT reset by KB interrupt
2	Mouse enable	WDT ignore MS interrupt	WDT reset by MS interrupt
7..3	Reserved		

Offset: 0x68 (Control register)

Bit	Function	0	1
0	WDT status (read only)	WDT continue	WDT time out occurred
1	Reserved		
2	Force time out	Keep status	Force time out
7..3	Reserved		

Sample code (using TurboC/C++ 3.0):

```
#include <dos.h>
#include <stdio.h>
#include <conio.h>
#include <iostream.h>
#include <process.h>

#define RUNTIME_REG_BASE          0x800
#define WDT_TIME_OUT_OFFSET    0x65 //Bit7=0(default) mean minute, bit7=1 mean second.
#define WDT_VAL_OFFSET    0x66 //Time out value (1~255), 0 (default) is mean disable.
#define WDT_CFG_OFFSET   0x67 //Bit1=1 (default) will clear WDT flag when KB interrupt,bit2=1 is MOUSE
interrupt.
#define WDT_CTRL_OFFSET 0x68 //Bit0=1 mean time out event occured (read only and it'll be clear
automatically),bit2=1 will force WDT event.
#define WDT_GP60_TYPE_OFFSET 0x47 //Bit3-2=11 mean WDT function, bit3-2=00 mean GPIO function.
Bit0=1 mean input, bit0=0 mean output or WDT.

void title(void);
void init(unsigned char,unsigned char);
unsigned char dec2hex(unsigned int);

void main()
{
        unsigned char val,val1;
        unsigned int val2;
        clrscr();
        title();
        cout<<"\n Now testing the WDT function on GX platform!\n";
        cout<<"Please select the time unit is minute (M) or second (S):";
        cin>>val;
        if ((val=='m')||(val=='M'))
        {
                val=0;
        }
        else
        {
                val=1;
        }
        cout<<"Please key in how many minutes/seconds for reset system(1~255):";
        cin>>val2;
        val1=dec2hex(val2);
        init(val,val1);
        cout<<"\nReady to start WDT count down ('s' to start or 'q' to quit)?";
        cin>>val;
        if((val=='q')||(val=='Q'))
        {
                exit(0);
        }
        else if ((val=='s')||(val=='S'))
        {
                outportb(RUNTIME_REG_BASE+WDT_GP60_TYPE_OFFSET,0x0c);          //Enable WDT
and starting count down.
        }
        exit(0);
}
```

```
void init(unsigned char flag,unsigned char time)
{
        unsigned char tmp0;
        outportb(RUNTIME_REG_BASE+WDT_GP60_TYPE_OFFSET,0x0d);          //Disable WDT function
(set it as input).
        tmp0=inportb(RUNTIME_REG_BASE+WDT_TIME_OUT_OFFSET);
        if (flag)
        {
                tmp0=tmp0|0x80;                 //Set time unit is second.
        }
        else
        {
                tmp0=tmp0&0x7f;                 //Set time unit is minute.
        }
        outportb(RUNTIME_REG_BASE+WDT_TIME_OUT_OFFSET,tmp0);
        outportb(RUNTIME_REG_BASE+WDT_VAL_OFFSET,time);             //Set time out vlaue.
        tmp0=inportb(RUNTIME_REG_BASE+WDT_CFG_OFFSET);
        tmp0=tmp0|0x06;
        outportb(RUNTIME_REG_BASE+WDT_CFG_OFFSET,tmp0);          //Set WDT interrupt by KB and
MOUSE.
}


void title(void)
{
        cout<<"\nUNICORN COMPUTER Corp,.     2006/09/14(ver:0.1 beta)";
        cout<<"\nDesigned by Robert Liou for testing WDT on GX2v1!\n\n";
}

unsigned char dec2hex(unsigned int number)
{
        unsigned char tmp_num0,tmp_num1;
        if(number>=255)
        {
                tmp_num0=number&0xff;
        }
        else
        {
                tmp_num1=(number/16)&0x0f;
                tmp_num1=tmp_num1<<4;
                tmp_num0=number%16;
                tmp_num0=tmp_num0|tmp_num1;
        }
        return(tmp_num0);
}
```


2-6. Digital I/O

● 16 Bits Digital I/O (CN7)

I/O type: Unidirectional for 8 bits input and 8 bits output with buffer

Pin definition:

CN7: DIGITAL I/O Pin Header (2x13 with 2.0mm)

Pin No.	H/W	S/W	Pin No.	H/W	S/W
1	OUTPUT-0	BIT0	**2**	OUTPUT-4	BIT4
3	OUTPUT-1	BIT1	**4**	OUTPUT-5	BIT5
5	OUTPUT-2	BIT2	**6**	OUTPUT-6	BIT6
7	OUTPUT-3	BIT3	**8**	OUTPUT-7	BIT7
9	GND	N/A	**10**	+5V	N/A
11	+12V	N/A	**12**	+3.3V	N/A
13	GND	N/A	**14**	KEY	N/A
15	+3.3V	N/A	**16**	+12V	N/A
17	+5V	N/A	**18**	GND	N/A
19	INPUT-0	BIT0	**20**	INPUT-4	BIT4
21	INPUT-1	BIT1	**22**	INPUT-5	BIT5
23	INPUT-2	BIT2	**24**	INPUT-6	BIT6
25	INPUT-3	BIT3	**26**	INPUT-7	BIT7

Operating condition: Due to this feature is addressing from ISA bus!
So, the ISA Bridge (IT8888G) must present on system for this feature support.

H/W jumper:

J1: DIGITAL Output Voltage Selector (CN7 only, 1x3 with 2.0mm)

Pin 1-2 *	+3.3V
Pin 3-4	+5V

S/W Port Address: Output (0x300), Input (0x301).

Sample code (using TurboC/C++ 3.0):

```
#define WRITE_OUT   0x300                   //8bit I/O output
#define READ_IN 0x301                               //8bit I/O input
                unsigned char val=0;
                val=inportb(READ_IN);       //Read 8 bits data from DIO port
                outportb(WRITE_OUT,val);            //Write 8 bits data to DIO port
```

- **8 Bits Digital I/O (UBIO1)**

I/O type: bidirectional for 8 bits I/O without buffer

Pin definition:

UBIO1: DIGITAL I/O (w/o buffer) Pin Header (2x6 with 2.0mm)

Pin No.	Function	Pin No.	Function
1	+3.3V	**2**	GND
3	GPIO0	**4**	GPIO4
5	GPIO1	**6**	GPIO5
7	GPIO2	**8**	GPIO6
9	GPIO3	**10**	GPIO7
11	GND	**12**	+3.3V

Operating condition: None, all of the standard types of M/B support this feature. This feature is sourcing from GPIO pin of super I/O chip (SCH3114 by SMSC). Please refer to the datasheet of SMSC for detail describe of register or the sample code of below.

S/W Port address: Base address (0x800).

Register offset:

Pin No.	Control	Data	Pin No.	Control	Data
GPIO0	0x3A	0x4d/bit7	**GPIO4**	0x6e	0x85/bit 4
GPIO1	0x39	0x4d/bit 6	**GPIO5**	0x6f	0x85/ bit 5
GPIO2	0x48	0x50/bit 2	**GPIO6**	0x72	0x85/ bit 6
GPIO3	0x33	0x4d/bit 1	**GPIO7**	0x73	0x85/ bit 7

Control register configuration (**GPIO0 to GPIO3**):

Pin No.	Function	0	1
BIT0	Input/Output	Output	Input
BIT1	Polarity	No invert	Invert
BIT2	GPIO/other function	GPIO	Other function
BIT [7..3]	Reserved		

Control register configuration (**GPIO4 to GPIO7**):

Pin No.	Function	0	1
BIT0	Input/Output	Output	Input
BIT1	Polarity	No invert	Invert
BIT2	GPIO/other function	Other function	GPIO
BIT [7..3]	Reserved		

Sample code (using TurboC/C++ 3.0):

```
#define BASE_ADDR  0x800                    //Base address
#define GPIO0_IO_CTRL       0x3a            //Control offset of GPIO0
#define GPIO0_DATA  0x4d                    //Data port of GPIO0
#define GPIO0_MASK 0x80             //Data mask of GPIO0
        unsigned char tmp;
        tmp=inportb(BASE_ADDR+GPIO0_IO_CTRL);
        tmp=tmp|0x01;                                           //Set GPIO0 as input
;       tmp=tmp&0xfe;                                           //Set GPIO0 as output
        outportb(BASE_ADDR+GPIO0_IO_CTRL,tmp);
        tmp=inportb(BASE_ADDR+GPIO0_DATA);          //Get data from GPIO0
        tmp=tmp&GPIO0_MASK;                                     //Clear un-used bit
;       outportb(BASE_ADDR+GPIO0_DATA,0x80);        //Set GPIO0 as logical "1"
;       outportb(BASE_ADDR+GPIO0_DATA,0x00);        //Set GPIO0 as logical "0"
```

2-8. PC104

- **There have 4 items in "Integrated Peripherals" menu of BIOS need to defined for PC104**

1. IT8888 ISA Decode IO

There have 5 sets (4..0) of decode addresses available in this item:

a). Decode I/O Space [4..0]: Enabled / Disabled
This item needs to set as "Enabled" to change the setting of below (from b to d).

b). Decode I/O Speed [4..0]: Subtractive Speed / Slow Speed / Medium Speed / Fast Speed.
Set decode speed as needs, generally is "Fast Speed".

c). Decode I/O Addr. [4..0] [15:4]: 0001 to 0fff (HEX number).
Set decodes address according to the interface need.

d). Decode I/O Size [4..0]: 1 / 2 / 4 / 8 / 16 / 32 / 64 /128 Bytes
Set how many size will be used on the interface.

2. IT8888 ISA Decode Memory

There have 4 sets (3..0) of decode addresses available in this item:

a). Decode Memory Space [3..0]: Enabled / Disabled
This item needs to set as "Enabled" to change the setting of below (b to d).

b). Decode Memory Speed [3..0]: Subtractive Speed/Slow Speed/Medium Speed/Fast Speed.
Set decodes speed as needs.

c). Decode Momory Addr. [3..0] [23:12]: 0000 to 0fff (HEX number).
Set decodes address according to the interface need.

d). Decode Momory Size [3..0]: 16K/32K/64K/128K/256K/512K/1M/2M Bytes
Set how many size will be used on the interface.

3. IT8888 DDMA

There have 6 DMA channels available on this item (**0/1/2/3/5/6/7**), please set one or more DMA channel as interface needs.

4. IRQ Resources

*Please set the item "*Resources Controlled By" as "**Manual**" from "**Auto (ESCD)**", then reserved one or more interrupt number for interface usage. Available number is: **3/4/5/7/10/11/14/15**.

- **Example operation (RS-232 card):**

Step 1: Setting the IO card jumper to assign the IO port address and IRQ number.
In this case, the port address of jumpers was been set as "3F8/IRQ4 (COM1)" and "2F8/IRQ3 (COM2)".

Step 2: Press "Del" key to get in the BIOS utility and disable all onboard COM ports, then select the "Integrated Peripherals" to set the decode address for RS-232 card. In the "IT8888 ISA Decode IO", change these 5 items as follows:

a). Decode I/O Space 0 / 1: Enable.
b). Decode I/O Speed 0 / 1: Fast Speed.
c). Decode I/O Addr. 0 / 1: 03f (COM1) / 02f (COM2).
d). Decode I/O Size 0 / 1: 16 Bytes.
e). Change the item "Resources Controlled By" as "Manual" from "Auto (ESCD)" and change the number 3 and 4 of interrupt as "Legacy ISA" from "PCI/ISA PnP".

Step 3: Plug the RS-232 card in M/B and turn on the power, the COM1 and COM2 of RS-232 card should be found in "System configuration table". Then, continue boot up to WINDOWS system and connect MODEM or other COM port devices to verify function.

Chapter 3. AWARD BIOS SETUP

Phoenix – Award BIOS CMOS Setup Utility

> Standard CMOS Features	**> PC Health Status**
> Advanced BIOS Features	**Load Optimized Defaults**
> Advanced Chipset Features	**Set Password**
> Integrated Peripherals	**Save & Exit Setup**
> Power Management Setup	**Exit Without Saving**
> PnP/PCI Configurations	

Use the BIOS CMOS setup program to modify the system parameters to reflect the environment installed in your system and to customize the system as desired. Press the <DEL> key to enter into the BIOS CMOS setup program when you turn on the power. Settings can be accessed via arrow keys. Press <Enter> to choose an option to configure the system properly.

In the main menu, press F10 or "SAVE & EXIT SETUP" to save your changes and reboot the system. Choose "EXIT WITHOUT SAVING" to ignore the changes and exit the setup procedure. Pressing <ESC> at anywhere during the setup will return to the main menu.

All of the above CMOS BIOS items require board knowledge on PC/AT system architecture. Incorrect setup could cause system malfunctions.

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3-1. Standard CMOS Features

The Standard Setup is used for the basic hardware system configuration. The main function is for Data/Time and Hard Disk Drive settings.

Item	Optimized defaults
Date (mm:dd:yy)	
Time (hh:mm:ss)	
IDE Primary Master	**Press Enter**
IDE Primary Slave	**Press Enter**
Driver A	1.44M, 3.5 in.
Video	EGA/VGA
Halt On	All , But Keyboard

· Video

Select the type of primary video subsystem.
<Choice: EGA / VGA, CGA 40, CGA 80, MONO>

· Halt On

Set the system's response to specific boot errors.
<Choice: All Errors, No Errors, All, But Keyboard, All, But Diskette, All, But Disk/Key >

IDE Primary Master/Slaver

Item	Optimized defaults
IDE HDD Auto-Detection	**Press Enter**
IDE Channel	**Auto**
Access Mode	**Auto**

The specifications of your drive must match with the drive table. The hard disk will not work properly if you enter incorrect information in this category. Select "Auto" whenever possible. If you select "Manual", make sure the information is from your hard disk vendor or system manufacturer.

3-2. Advanced BIOS Features

This section allows you configuring your system for basic operation. You have the opportunity to select the system's default speed, boot-up priority, keyboard operation and security.

Item	Optimized defaults
Virus Warning	Disabled
CPU Internal Cache	Enabled
First Boot Device	Floppy
Second Boot Device	HDD-0
Third Boot Device	LS120
Boot Other Device	Enabled
Swap Floppy Drive	Disabled
Boot Up Floppy Seek	Disabled
Boot Up NumLock Status	On
Gate A20 Option	Fast
Typematic Rate Setting	Disabled
Typematic Rate (Chars/Sec)	6
Typematic Delay (Msec)	250
Security Option	Setup
OS Select For DRAM > 64MB	Non-OS2
HDD S.M.A.R.T. Capability	Disabled
Video BIOS Shadow	Enabled
C8000-CBFFF Shadow	Disabled
CC000-CFFFF Shadow	Disabled
D0000-D3FFF Shadow	Disabled
D4000-D7FFF Shadow	Disabled
D8000-DBFFF Shadow	Disabled
DC000-DFFFF Shadow	Disabled
Small Logo(EPA) Show	Enabled
Cyrix 6x86/MII CPUID	Enabled

3-3. Advanced Chipset Features

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and the access to the system memory resources, such as DRAM and the external cache. It also coordinates the communications with the PCI bus. It must be stated that these items should never be altered. The default settings have been chosen because they provide the best operating conditions for your system. You might consider making any changes only if you discover that the data has been lost while using your system.

Item	Optimized defaults
Video Memory Size	16M
Flat Panel Configuration	Press Enter
Onboard Audio	Enabled
Onboard USB1.1	Enabled
Onboard USB2.0	Enabled

· Video Memory Size

This field is used to select the onboard VGA's frame buffer size that is shared from the system memory.
<Choice: Disabled, 4M, 6M,8M,12M,16M>

· Flat Panel Configuration

Item	Optimized defaults
Flat Panel Type	CRT
Resolution	640x480
Bus Width	24 Bit
Data Type	Normal
Refresh Rate	60 Hz
HSYNC Polarity	Low
VSYNC Polarity Active	Low
SHFCLK Active Period	Free runing
LP Active Period	Free runing

· Flat Panel Type

This field is used to select the type of display to use when the system boot.
<Choice: CRT/LCD>

Resolution

This field is used to select the resolution of LCD panel.
<Choice: 640x480/800x600/1024x768/1152x864/1280x1024/1600x1200>

Bus Width

This field is used to select the bus width of LCD panel. Generally is "24bits".
<Choice: 8/9/12/16/18/24>

Data type

This field is used to select the data type of LCD panel. Generally is "Normal".
<Choice: Normal/2 X>

Refresh Rate

This field is used to select the refresh rate (VSYNC frequency) to LCD panel. Default is "60 Hz".
<Choice: 60/65/70/72/75/85>

HSYNC Polarity

This field is used to select the polarity of HSYNC for LCD. Default is "Low".
<Choice: Low/High>

VSYNC Polarity Active

This field is used to select the polarity of VSYNC for LCD. Default is "Low".
<Choice: Low/High>

SHFCLK Active Period

This field is used to select the working period of shift clock. Generally is "Free running".
<Choice: Free running/Active only>

LP Active Period

This field is used to select the working period of line pulse. Generally is "Normal".
<Choice: Free running/Active only>

If you apply one of the standard panels shown above, select the appropriate option according to the type of panel that you apply. Or, please contact your dealer or sales representative for custom-made BIOS that will suit the panel that you apply.

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3-4. Integrated Peripherals

The IDE hard drive controllers support up to two separate hard drives. These drives have a master/slave relationship that is determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers--a primary and a secondary--so you can install up to four separate hard disks.

Integrated Peripherals

Item	Optimized defaults
Master Drive PIO Mode	Auto
Slave Drive PIO Mode	Auto
IDE Primary Master UDMA	Auto
IDE Primary Slave UDMA	Auto
IDE DMA transfer access	Enabled
IT8888 ISA Decode IO	Press Enter
IT8888 ISA Decode Memory	Press Enter
IT8888 DDMA	Press Enter
IDE HDD Block Mode	Enabled
Onboard Lan Boot ROM	Disabled
Onboard FDC Controller:	Enabled
Onboard Serial Port 1	3F8/IRQ4
Onboard Serial Port 2	2F8/IRQ3
Onboard Serial Port 3	3E8/IRQ4
Onboard Serial Port 4	2E8/IRQ3
Onboard Parallel Port	378/IRQ5
Parallel Port Mode	Standard
ECP Mode Use DMA	3

Master/Slave PIO Mode

The two IDE PIO (programmed Input/Output) fields let you set a PIO mode (0-4) for each IDE device that the internal PCI IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

IDE Primary Master/Slave UDMA

These fields allow you to set the Ultra DMA in use. When Auto is selected, the BIOS will select the best available option after checking your hard drive or CD-ROM.

· IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sectors read/write.

· IT8888 ISA Decode IO

Item	Optimized defaults
Decode I/O Space 0	Disable
Decode I/O Speed 0	Subtractive Speed
Decode I/O Addr. 0 [15:4]	001
Decode I/O Size 0	1 Bytes
Decode I/O Space 1	Disable
Decode I/O Speed 1	Subtractive Speed
Decode I/O Addr. 1[15:4]	001
Decode I/O Size 1	1 Bytes
Decode I/O Space 2	Disable
Decode I/O Speed 2	Subtractive Speed
Decode I/O Addr. 2[15:4]	001
Decode I/O Size 2	1 Bytes
Decode I/O Space 3	Disable
Decode I/O Speed 3	Subtractive Speed
Decode I/O Addr. 3[15:4]	001
Decode I/O Size 3	1 Bytes
Decode I/O Space 4	Disable
Decode I/O Speed 4	Subtractive Speed
Decode I/O Addr. 4[15:4]	001
Decode I/O Size 4	1 Bytes
Decode I/O Space 5	Disable
Decode I/O Speed 5	Subtractive Speed
Decode I/O Addr. 5[15:4]	001
Decode I/O Size 5	1 Bytes

· Decode I/O Space 0~5

Enable or Disable the Decode I/O space function (0~5).

· Decode I/O Speed 0~5

Set the Decode I/O speed (0~5)

<Choice: Subtractive Speed/Slow Speed/Medium Speed/Fast Speed>

· Decode I/O Addr. 0~5 [15:4]

Set the Decode I/O base address (0~5, the available range of this value is "0001" to "0FFF").

· Decode I/O Size 0~5

Set the Decode I/O size.

<Choice: 1/2/4/8/16/32/64/128 Bytes >

· IT8888 ISA Decode Memory

Item	Optimized defaults
Decode Memory Space 0	Disable
Decode Memory Speed 0	Subtractive Speed
Decode Memory Addr. 0 [23:12]	000
Decode Memory Size 0	16 KB
Decode Memory Space 1	Disable
Decode Memory Speed 1	Subtractive Speed
Decode Memory Addr. 1 [23:12]	000
Decode Memory Size 1	16 KB
Decode Memory Space 2	Disable
Decode Memory Speed 2	Subtractive Speed
Decode Memory Addr. 2 [23:12]	000
Decode Memory Size 2	16 KB
Decode Memory Space 3	Disable
Decode Memory Speed 3	Subtractive Speed
Decode Memory Addr. 3 [23:12]	000
Decode Memory Size 3	16 KB

· Decode Memory Space 0~3

Enable or Disable the Decode memory space function (0~3).

· Decode Memory Speed 0~3

Set the Decode Memory speed 0~3

<Choice: Subtractive Speed/Slow Speed/Medium Speed/Fast Speed>

· Decode Memory Addr. 0~3 [23:12]

Set the Decode memory base address (0~3, the available range of this value is "0001" to "0FFF").

· Decode Memory Size 0~3

Set the Decode memory size.

<Choice: 16 KB/32 KB/64 KB/128 KB/256 KB/512 KB/1 MB/2 MB>

· IT8888 ISA DDMA

Item	Optimized defaults
DDMA0 Support	Disable
DDMA1 Support	Disable
DDMA2 Support	Disable
DDMA3 Support	Disable
DDMA5 Support	Disable
DDMA6 Support	Disable
DDMA7 Support	Disable

Enable or Disable the DMA channel for ISA device.

· Onboard LAN Boot ROM

By default, this field is disabled. Enable this field if you wish to use the boot ROM (instead of a disk drive) to boot-up the system and access the local area network directly.

· Parallel Port Mode

Set the parallel port mode.

<Choice: Standard/SPP/EPP1.7/EPP1.9/ECP/ECP+EPP>

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3-5. Power Management Setup

The Power Management Setup allows users configuring the system to save energy in a most effective way while operating in a manner consistent with their own style of computer use.

Item	Optimized defaults
ACPI function	Enabled
ACPI Suspend Type	S1(POS)
Standby Mode	Disabled
Suspend Mode	Disabled
Soft-Off by PWRBTN	Instant-Off
Power-On by Alarm	Disabled
Time (hh:mm:ss) Alarm	0
	0
	0
IRQ Wakeup Events	Press Enter

· ACPI Suspend Type

This field is used to select the type of Suspend mode.

S1(POS)	Enables the Power On Suspend function.

3-6. PnP/PCI Configurations

This section describes the configuration of the PCI bus system. PCI is a system that allows I/O device to operate at speeds nearing the speed of the CPU itself, when communicating with its own special components. This section covers some very technical items. It is strongly recommended that only experienced users make any changes to the default settings.

Item	Optimized defaults
PNP OS Installed	No
Init Display First	PCI Slot
Reset Configuration Data	Disabled
Resources Controlled By	Auto(ESCD)
IRQ Resources	Press Enter
DMA Resources	Press Enter
Memory Resources	Press Enter
PCI/VGA Palette Snoop	Disabled

.

· **Reset Configuration Data**

Enabled	The BIOS will reset the Extended System Configuration Data (ESCD) once automatically. It will then recreate a new set of configuration data.
Disabled	The BIOS will not reset the configuration data.

· **Resources Controlled By**

Auto(ESCD)	The system will automatically detect the settings for you.
Manual	Choose the specific IRQ in the "IRQ Resources" field.

· **PCI/VGA Palette Snoop**

When set to [Enabled], multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled).

3-7. PC Health Status

This screen shows the information of temperature, Fan speed and Vcore etc. It also can set CPU warning temperature to protect CPU.

PC Health Status

Item	Optimized defaults
Current CPU Temperature	
VCC	
5 VTR	
5 V	
12 V	
Fan1 Speed	
Fan2 Speed	

Chapter 4. VGA, LCD and drivers

4-1. Graphic controller Feature

The ENDAT-GX201 integrated a high performance with low power consumption 2D graphics engine. The graphics controller is full compliance and compatibility with IBM® VGA and VESA™ extended VGA.

The display controller is integrated video DACs and TFT LCD interface for various embedded application. The display operation is support CRT or TFT LCD only; the simultaneous operation mode is not supported by this graphics controller.

The on-board Graphics Controller's main system features include:

- High Performance 2D graphics controller
- Alpha BLT
- Hardware frame buffer compression improves UMA (Unified Memory Architecture) memory efficiency
- Support up to 1600 x 1200 x 16 bpp and 1280 x 1024 x 24 bpp running at 85 HZ (CRT/LCD monitor)
- Hardware based VGA (Video Graphics Array)
- Hardware video up/down scalar
- Graphics/video alpha blending
- Integrated dot clock PLL (Phase Lock Loop) up to 230 MHZ
- Direct TFT LCD support up to 1280 x 1024 x 24.

4-2. LCD Flat Panel

- **Flat Panel Interface**

The on-board graphics controller also support industry standard TFT LCD panel, the interface supports both of TTL and LVDS (optional):

TTL interface: 9, 12, 18 and 24bit by **standard** version support.
LVDS interface: 18 and 24bit by **optional** feature support.

LVDS interface provides a low voltage, high speed and low EMI serial DC-balanced differential data via optional onboard LVDS.

The flat panel interface provides or supports the following functions for various panels:

- Generates flat panel interface signals like FLM, LP, SCLK, and DE
- Generates different video data formats to directly drive different types of panels
- Vertical and horizontal expansion of video displays to LCD panel resolution
- Vertical and horizontal centering
- Panel power sequence

Due to the ENDAT-GX201 is not support the simultaneous operation mode (CRT + LCD), any mismatch timing setting in BIOS will affect the LCD screen display with noise, shift, or other abnormally symptoms. Please refer to the operation guide of next page to support all of the LCD application on ENDAT-GX201:

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- **Operation guide:**

The graphics controller of ENDAT-GX201 is only support VESA timing for all LCD configurations; please make sure the LCD which applies on this board is fully compliant with VESA standard timing.

Operation procedure:

- **Step 1**: Set the JP8 as "CRT (close pin2 and pin3)".
- **Step 2**: Press <Del> key when system boot up and enter the CMOS BIOS setup utility.
- **Step 3**: Change the parameter of LCD setting in BIOS to match the LCD spec.
- **Step 4**: Press <F10> to save the change and exit the BIOS utility, turn off the system power after system is finished all boot up procedure.
- **Step 5**: Set the LCD power by JP6 to match the LCD spec and set the JP8 as "LCD (close pin1 and pin2)".
- **Step 6**: Turn on the system and measure the LCD power by voltage meter, turn off the system power and if the voltage is correct or change JP6 again if voltage is not correct.
- **Step 7**: Turn off the power and connect LCD to M/B for verify the LCD display screen is correct or not.
- **Step 8**: Change the JP8 as "CRT (close pin2 and pin3)" to continue testing the LCD parameter in BIOS while LCD display cannot be seen.
- **Step 9**: Please contact the dealer or sales department of UNICORN and send one set of LCD (LCD, INVERTER, cables) to them for more detail testing in the configuration.

Note: The JP8 will affect anytime with any BIOS setting even with a wrong setting of LCD parameter in BIOS. It can force the display device as "CRT/LCD monitor" when LCD display not working with currently parameters of LCD.

H/W jumper:

JP8: LCD / CRT selector (1x3 with 2.0mm)

Pin 1-2	LCD
Pin 2-3*	CRT

JP6: LCD Voltage Selector (2x3 with 2.0mm)

Pin 1-2 *	+3.3V
Pin 3-4	+5V
Pin 5-6	+12V

Caution: Improper setting will damage LCD panel.

JP7: LVDS Trigger Edge Selector (1x3 with 2.0mm)

Pin 1-2 *	Rising edge
Pin 2-3	Falling edge

BIOS setting:

· Flat Panel Type

This field is used to select the type of display to use when the system boot.
<Choice: CRT/LCD>

· Resolution

This field is used to select the resolution of LCD panel.
<Choice: 640x480/800x600/1024x768/1152x864/1280x1024/1600x1200>

· Bus Width

This field is used to select the bus width of LCD panel. Generally is "24bits".
<Choice: 8/9/12/16/18/24>

· Data type

This field is used to select the data type of LCD panel. Generally is "Normal".
<Choice: Normal/2 X>

· Refresh Rate

This field is used to select the refresh rate (VSYNC frequency) to LCD panel. Default is "60 Hz".
<Choice: 60/65/70/72/75/85>

· HSYNC Polarity

This field is used to select the polarity of HSYNC for LCD. Default is "Low".
<Choice: Low/High>

· VSYNC Polarity Active

This field is used to select the polarity of VSYNC for LCD. Default is "Low".
<Choice: Low/High>

· SHFCLK Active Period

This field is used to select the working period of shift clock. Generally is "Free running".
<Choice: Free running/Active only>

· LP Active Period

This field is used to select the working period of line pulse. Generally is "Normal".
<Choice: Free running/Active only>

Please note that the default setting is with "CRT only". If the LCD display feature is required, the setting will need to be revised in the system BIOS setting: "Select Display Device" under "Advanced Chipset Features"; unless it is specified at the time of order.

4-3. Driver Utility Installation Guide

1. When finishing the installation of Windows XP, please install the relative AMD display and AUDIO driver manually for compliance compatibility of hardware environment.

2. Please contact sales department of UNICORN for Embedded OS user driver (Windows CE and Windows XP embedded). All of embedded OS driver is not be included in any versions of driver CD-ROM from UNICORN.

Please download or check from AMD Web site: www.amd.com for more information or last versions of driver as needs!

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Chapter 5. LAN Adapter

The ENDAT-GX201 integrated two 10/100 Fast Ethernet Controllers by two Realtek RTL8100C chips. Both of two chips complies with the IEEE 802.3x standard, IEEE802.3 standard and PCI Local Bus version 2.2 and transmits data on the network at 100 Mbps or 10 Mbps. It also operates in full-duplex mode that **doubles the network speed up to 20/200 Mbps when working with Fast Switching Hub.** Built-in two RJ-45 ports for each RTL8100C connection to 10/100 Ethernet network, and automatically senses the connection type.

5-1. Features

- Full compliancy with PCI Rev. 2.2
- Complies with the Ethernet/IEEE 802.3u 100Base-TX and 10 Base-T industry standard
- Supports full-duplex operations, thus doubling the network speed up to 20Mbps on 10 Base-T Ethernet or 200Mbps on 100 Base-TX Fast Ethernet when setting in full duplex mode
- Two LED indicators to report network status for each port
- Two RJ-45 connector with Auto-sense cable type of 10 or 100Mbps network operation
- Supports PCI clock speed up to 33MHz
- Supports Remote Boot ROM by system BIOS (Only available on LAN1)
- Support WOL (Wake On LAN) function on-board (Only available on LAN1)
- Provides a comprehensive setup program for displaying the adapter configuration and includes diagnostic on board or network tests

5-2. UTP Cable / RJ-45 Jack Definition

Straight through twisted pair cable is typically used to connect a hub to a server or workstation. In a straight through connection, Pin 1 at the server, Pin 2 at the hub connects to Pin 2 at the server, and so on. Figure A-1 shows the locations of pins on a standard RJ-45 plug on a twisted-pair cable.

Table A-1 shows the wiring in a straight-through twisted-pair cable (Pins 4, 5, 7 and 8 are not used).

Twisted Pair Number	Pin Number	Signal Description	To	Pin Number	Signal Description
1	1 2	TD+ TD–	→	1 2	TD+ TD–
2	3 6	RD+ RD–	→	3 6	RD+ RD–

Table A-1

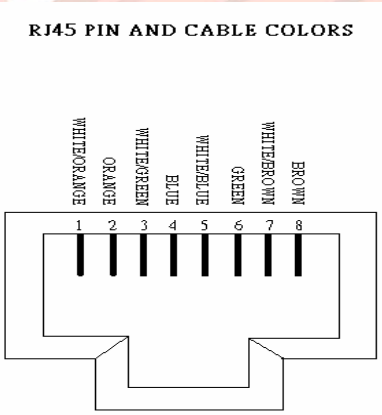

Figure A-1

5-3. Connecting 100Base-TX Fast Ethernet Network

To connect the adapter to 100Base-TX Fast Ethernet Network, you need a twisted-pair Category 5 cable with RJ-45 modular jacks at both ends. This cable can have a maximum length of 300 feet (100 meters).

5-4. Remote BOOT ROM function

This function is available with the BIOS programming for indicated operation system. The remote boot function allows the computer to boot up over the network, instead of using the local operating system device. This enables the system to be a diskless workstation environment.

5-5. Diagnostic Program (RSET8139)

This program allows you to verify the configuration and isolation of faults.

Program (RESET8139.exe) provides the following function:

- Displays the current configuration of the adapter
- Performs network diagnostic tests to verify the operation of the adapter's basic functions, and the adapter's ability to communicate over the network with another adapter.
- Provides set up for new configuration to make a change specify settings: Remote BOOT ROM, Flow Control and Full-Duplex mode Enable/or Disable

Full duplex operation is set automatically if the Full-duplex option is set to Disable. Please follow the prompt instructions to set-up or change the system configuration.

Note: Before running the setup program, make sure the adapter's driver is not loaded, otherwise unpredictable results may arise!

The program can be set the on board configuration to provide diagnostic testing. It is for testing the basic function verification, EEPROM data Access, loop back operation, and the ability to communicate over the network with another adapter.

To access this program, insert the Driver Diskette into the floppy disk drive or other bootable device (such as USB flash disk) and then type the following at the DOS prompt:

- A:\REST8139.EXE <ENTER>

1. View Current Configuration

This allows you to find the PCI Fast Ethernet adapter current configuration in your system.

2. Set Up New Configuration

Select Set Up New Configuration option from the main menu

The option settings can be changed, the table shown as below:

Option	Default Setting	Other Available Settings
Medium Type	Auto Selection	100 Full – Forces to full duplex operation
Flow Control	Tx Enable, Rx Enable	Tx Disable, Rx Disable

Note: Before setting the adapter for full duplex, make sure the hub switch is also set to full duplex. Before you activate the switching hub to server connection, make sure the hub switch and adapter are configured for full duplex.

3. Run Diagnostics

Running diagnostic tests perform basic function verification for on board LAN adapters. The basic Diagnostic tests include:

- **EEPROM Test**: EEPROM data read/write test
- **Diagnostics On Board**: Performs on board basic function verification
- **Diagnostics On Network**: To run this test on the network, you will need another computer set up as a Responder to receive packets from the adapter being tested and echo them back to the adapter. This checks the adapter's ability for communication over the network with another adapter to receive and transmit network packets.

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Appendix A: FLASH Memory Utility

Using this utility to update the system BIOS from a disk file to the on board Flash memory. Be aware the improper change of the system BIOS will cause the system to malfunction.

Using utility as follows:

1. Insert the FLASH memory utility distribution floppy diskette in drive A:
2. At the DOS prompt, type A:>AWDFLASH and press <Enter>

AwardBIOS FLASH Utility V8.24G C>Phoenix Technologies Ltd. All Rights Reserved
Flash Type – File Name to Program:
Message:

3. Enter the name of the system BIOS disk file into the "File Name to Program" field. The following message appears in the "Message" field
4. Do you want to save BIOS (y/n)?
5. To update the FLASH memory from the system BIOS disk file, type Y
6. After complete updating, please re-boot the system (press "**F1**" key)
7. For upgrade BIOS procedure, please refer to our web site: http://www.unicorn-computer.com.tw

**** Please turn off system and clear CMOS data by JBAT1.***

**** Please restart your system and load setup default /***

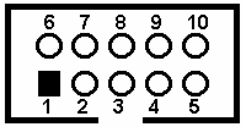
Appendix B: Connector Pin Assignment

VGABH1: CRT Box Header Connector (2x8 with 2.54mm)

Pin No.	Description	Pin No.	Description
1	RED	**9**	N.C / +5V
2	GREEN	**10**	GND
3	BLUE	**11**	N.C.
4	N.C.	**12**	DDC DAT
5	GND	**13**	H-Sync
6	GND	**14**	V-Sync
7	GND	**15**	DDC CLK
8	GND		

CN8/4: Box Header Type Connector for COM3/4 port (2x5 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	DCD	**6**	DSR
2	RXD	**7**	RTS
3	TXD	**8**	CTS
4	DTR	**9**	RI
5	GND	**10**	N.C.



LPT1: Printer Port Box Header (2x13 with 2.54mm)

Pin No.	Description	Pin No.	Description
1	STB#	**10**	ACK#
2	PD0	**11**	BUSY
3	PD1	**12**	PE
4	PD2	**13**	SLCT
5	PD3	**14**	AFD#
6	PD4	**15**	ERR#
7	PD5	**16**	INIT#
8	PD6	**17**	SLIN#
9	PD7	**18-25**	GND

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FDD1: FDD Box Header (2x17 with 2.54mm)

Pin No.	Description	Pin No.	Description
1,3,5,7	GND	**14**	DSA#
9,11,13	GND	**16**	MOB#
15,17,19	GND	**18**	DIR
21,23,25	GND	**20**	STEP#
27,29,31	GND	**22**	WD#
33	GND	**24**	WE#
2	RWC#	**26**	TRAK0
4,6	N.C	**28**	WP#
8	INDEX#	**30**	RDATA#
10	MOA#	**32**	HEAD#
12	DSB#	**34**	DSKCHG#

IDE1 Box Header (2x20 with 2.54mm)

Pin No.	Description	Pin No.	Description
1	IDE Reset#	**2**	GND
3	IDE data7	**4**	IDE data8
5	IDE data6	**6**	IDE data9
7	IDE data5	**8**	IDE data10
9	IDE data4	**10**	IDE data11
11	IDE data3	**12**	IDE data12
13	IDE data2	**14**	IDE data13
15	IDE data1	**16**	IDE data14
17	IDE data0	**18**	IDE data15
19	GND	**20**	N.C.
21	IDE REQ	**22**	GND
23	IDE IOW#	**24**	GND
25	IDE IOR#	**26**	GND
27	IDE Ready	**28**	GND
29	IDE ACK#	**30**	GND
31	IDE IRQ	**32**	N.C.
33	IDE A1	**34**	P66DET
35	IDE A0	**36**	IDE A2
37	IDECS1#	**38**	IDESC3#
39	HDLED#	**40**	GND

IDE1B: Slim IDE1 Connector (2x22 with 2.0mm)

Pin No.	Description	Pin No.	Description
1	IDE Reset#	**2**	GND
3	IDE data7	**4**	IDE data8
5	IDE data6	**6**	IDE data9
7	IDE data5	**8**	IDE data10
9	IDE data4	**10**	IDE data11
11	IDE data3	**12**	IDE data12
13	IDE data2	**14**	IDE data13
15	IDE data1	**16**	IDE data14
17	IDE data0	**18**	IDE data15
19	GND	**20**	N.C.
21	IDE REQ	**22**	GND
23	IDE IOW#	**24**	GND
25	IDE IOR#	**26**	GND
27	IDE Ready	**28**	GND
29	IDE ACK#	**30**	GND
31	IDE IRQ	**32**	N.C.
33	IDE A1	**34**	P66DET
35	IDE A0	**36**	IDE A2
37	IDECS1#	**38**	IDESC3#
39	HDLED#	**40**	GND
41	VCC (+5V)	**42**	VCC (+5V)
43	GND	**44**	N.C.

TTL1: TTL LCD Panel Box Header (2x22 with 2.0mm)

Pin No.	Signal	Pin No.	Signal
1	VBL (+12V)	**2**	VBL (+12V)
3	GND	**4**	GND
5	LCD-PWR	**6**	LCD-PWR
7	ENBKLT	**8**	GND
9	B0	**10**	B1
11	B2	**12**	B3
13	B4	**14**	B5
15	B6	**16**	B7
17	G0	**18**	G1
19	G2	**20**	G3
21	G4	**22**	G5
23	G6	**24**	G7
25	R0	**26**	R1
27	R2	**28**	R3
29	R4	**30**	R5
31	R6	**32**	R7
33	GND	**34**	GND
35	CLK	**36**	V-SYNC
37	DE	**38**	H-SYNC
39	GND	**40**	LCD-PWR
41	LCD-PWR	**42**	**KEY**
43	LCD-PWR	**44**	LCD-PWR

LVDS1: LVDS LCD Pin Header (2x8 with 2.54mm)

Pin No.	Description	Pin No.	Description
1	Y0-	**2**	Y2-
3	Y0+	**4**	Y2+
5	Y1-	**6**	LCD-PWR
7	GND	**8**	Y3-
9	Y1+	**10**	Y3
11	CK-	**12**	LCD-PWR
13	CK+	**14**	ENBKLT
15	VBL (+12V)	**16**	GND

Please make sure the Pin 1 location before inserting the LCD connector.

JUSB1: Pin Header for USB port (2x5 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	USB_VCC	**2**	USB_VCC
3	USBD2-	**4**	USBD3-
5	USBD2+	**6**	USBD3+
7	USB_GND	**8**	USB_GND
9	USB_GND	**10**	USB_GND

FAN1, FAN2: Cooling Fan Connector

Pin No.	Function
1	GND
2	+12V
3	Sensor Pin

CN5: PS/2 Keyboard / Mouse Pin Header (2x5 with 2.0mm)

Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	KB Data	**2**	MS Data
3	KEY	**4**	KEY
5	GND	**6**	GND
7	+5V(DC)	**8**	+5V(DC)
9	KB_CLK	**10**	MS_CLK

IRDA1: IR Pin Header (1x5 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	+5V	**4**	GND
2	N.C	**5**	IRTX
3	IRRX		

SMB1: SM Bus Pin Header (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	SMBCK	**3**	+3.3V
2	SMBDT	**4**	GND

CN7: DIGITAL I/O Pin Header (2x13 with 2.0mm)

Pin No.	Function	Pin No.	Function
1	DIO-O0	**2**	DIO-O4
3	DIO-O1	**4**	DIO-O5
5	DIO-O2	**6**	DIO-O6
7	DIO-O3	**8**	DIO-O7
9	GND	**10**	+5V
11	+12V	**12**	+3.3V
13	GND	**14**	KEY
15	+3.3V	**16**	+12V
17	+5V	**18**	GND
19	DIO-I0	**20**	DIO-I4
21	DIO-I1	**22**	DIO-I5
23	DIO-I2	**24**	DIO-I6
25	DIO-I3	**26**	DIO-I7

Note: Only available when PC104 function present

UBIO1: DIGITAL I/O (w/o buffer) Pin Header (2x6 with 2.0mm)

Pin No.	Function	Pin No.	Function
1	+3.3V	**2**	GND
3	GPIO0	**4**	GPIO4
5	GPIO1	**6**	GPIO5
7	GPIO2	**8**	GPIO6
9	GPIO3	**10**	GPIO7
11	GND	**12**	+3.3V

CN10: MIC IN (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	MIC POWER	**2**	GND
3	GND	**4**	MIC IN

CN9: LINE IN (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	LINE IN-L	**2**	GND
3	GND	**4**	LINE IN-R

CN11: LINE OUT (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	LINE OUT-R	**2**	GND
3	GND	**4**	LINE OUT-L

CN12: CD IN Pin Header (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	CD IN-R	**2**	GND
3	GND	**4**	CD IN-L

CN13: SPEAKER OUT (1x4 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	SPEAKER OUT-R	**2**	GND
3	GND	**4**	SPEAKER OUT-L

D-SUB Type Connector for COM2 port (RS-232)

Pin No.	Description	Pin No.	Description
1	DCD	**6**	DSR
2	RXD	**7**	RTS
3	TXD	**8**	CTS
4	DTR	**9**	RI
5	GND		

D-SUB Type Connector for COM2 port (RS-422→ 4 Wire)

Pin No.	Function	Pin No.	Function
1	–TXD	**6**	NA
2	+RXD	**7**	NA
3	+TXD	**8**	NA
4	NA	**9**	–RXD
5	NA		

D-SUB Type Connector for COM2 port (RS-485→ 2 Wire)

Pin No.	Function	Pin No.	Function
1	Data –	**6**	NA
2	NA	**7**	NA
3	Data +	**8**	NA
4	NA	**9**	NA
5	NA		

ATXPWR: ATX Power connector

ATX

3.3V	**11**	**1**	3.3V
–12V	**12**	**2**	3.3V
GND	**13**	**3**	GND
PS ON	**14**	**4**	+5V
GND	**15**	**5**	GND
GND	**16**	**6**	+5V
GND	**17**	**7**	GND
–5V	**18**	**8**	POWER OK
+5V	**19**	**9**	5V SB
+5V	**20**	**10**	+12V

Appendix C: LIMITED WARRANTY

Standard one year limited warranty on all our ENDAT series all-in-one motherboards and embedded board. Products that become defective during the warranty period shall be repaired, or subject to manufacturer's option, replaced. The limited warranty applies to normal proper usage of the hardware and does not cover products that have been modified or subjected to unusual electrical or physical stress. Unicorn Computer Corp is not liable to repair or replace defective goods caused by improper using or use of unauthorized parts. The following situations will be charged:

1. The products during the warranty but defective caused by improper using or artificial external pressure and result in the components damages. According to the damage situation, the manufacturer has the rights to decide to repair or not. The manufacturer will charge the parts/repair cost and the returning shipping charge.
2. The products out of warranty will charge the parts/repair cost and the returning shipping charge as per the repair status.
3. The manufacturer has the rights to decide to repair or not based on the stock of parts for the products which are phased out of the production.
4. Please e-mail or fax the RMA Service Request Form when have the defective products.

RMA SERVICE REQUEST FORM

When requesting RMA service, please fill out this "RMA Service Request Form". This form needs to be shipped with your returns. Service cannot begin until we have this information.

RMA NO.:

Company: Person to Contact:

Phone No: Purchase Date :

Fax No. : Applied Date :

Return Shipping Address:

Model No.	Serial No.	Problem Code	Remark

- **Issue Code of defect.**

01	Second Times R.M.A.	11	Memory Socket Bad
02	No Screen (No Boot)	12	Hang Up Hardware
03	VGA (Display) Fail	13	Hang Up Software
04	CMOS Data Lost	14	PCB Problem
05	FDC Fail	15	CPU Socket Bad
06	HDC Fail	16	LAN Fail
07	Bad Slot	17	Audio Fail
08	BIOS Problem	18	Serial Port Fail
09	Keyboard Controller Fail	19	Parallel Port Fail
10	Cache RAM Problem	20	Others

Please specify the following when returning the RMA boards:
(1) Hardware Configuration (2) OS or Software (3) Testing Program

_____
Authorized Signature